

THE IMPACT OF THE COVID-19 PANDEMIC ON AGRICULTURE AND THE FOOD ECONOMY IN THE LIGHT OF THE LITERATURE

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Abstract. The COVID-19 pandemic has had many negative effects throughout the world. The pandemic has created many threats to the development of the agricultural sector, which is of particular importance in ensuring the security of the food supply. The aim of this paper is to examine the consequences of the global COVID-19 pandemic on agriculture, agri-food system and rural areas in developed countries as identified in the literature. The impact of the pandemic is divided into economic and social effects. A literature review was used to identify the current state of knowledge on the topic. The study found that the consequences of the pandemic occurred in every element of the food chain. The onset of the pandemic was characterised by shortages of many agri-food products, especially for certain groups of people who were unable to use the new sales channels. Production in the agricultural sector proved to be fairly resilient to the impact of the pandemic. However, the income insecurity of farms has increased significantly, especially for farms that offer seasonal products, rely on migrant labour and sell to the HoReCa sector. Food consumer behaviour has changed, which may have long-term consequences for the food economy. The social impact of the pandemic relates primarily to the increased digital exclusion of rural areas and the social exclusion of the elderly. The uncertainty of farmers' income and the deepening of social exclusion seem to be the most severe consequences of the pandemic in agriculture, agri-food sector and in rural areas.

Keywords: COVID-19, agriculture, food economy.

JEL code: Q01, Q10.

Introduction

The COVID-19 pandemic spread rapidly around the world and caused many negative impacts, threatening food security, agriculture and food systems (Deaton and Deaton, 2020). However, the impact of the pandemic on the agri-food sector was different from other sectors. The restrictions and limitations placed on the economy, in general, did not affect the primary agriculture sector as it was considered a basic service and consequently, the sector continued to operate during the pandemic (Weersink et al., 2021). However, the pandemic caused some disruptions in the agricultural sector that may have long-term consequences. Previous research indicates that the severity of the impact of a pandemic varies depending on the region of the world, the level of food market development, the wealth of societies, the type of linkage in the system and the response of public institutions influencing its operation (OECD, 2020), but severe negative consequences are felt most by the most vulnerable (Stephens et al., 2020).

Researchers argue that COVID-19 triggered a crisis with economic (Nicola et al., 2020), social (Blofield et al., 2020) and political (van der Ploeg, 2020) dimensions. According to some researchers, the impact of the crisis has reduced environmental pressures in the short term, leading mainly to slower economic growth in labour-intensive sectors such as agriculture and services (Aday and Aday, 2020).

At the same time, researchers stress that as a result of the pandemic, food systems will not function on business as usual (Darnhofer, 2020; OECD, 2021), and at the same time see this situation as an opportunity to create transformative public policies to build more sustainable food systems, as well as to enable the maintenance and development of food system innovations emerging during the pandemic (Hobbs, 2020).

The aim of this paper is to examine the consequences of the global COVID-19 pandemic on agriculture, agri-food system and rural areas in developed countries as identified in the literature.

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The main contribution of this article is to systematize and group the areas most affected by the consequences of the pandemic based on scientific research. Identification of these areas will allow good design of effective support systems.

To achieve the aim of the study, I carried out, a systematic literature review. A literature review is an appropriate research method when researchers wish to evaluate a theory or evidence in a particular area, examine the validity of a particular theory or examine the influence of specific variables (Tranfield et al., 2003). Google scholar was searched for various combinations of the words: COVID-19, agriculture, agri-food system, rural areas. Articles relating to developed countries were selected. 41 publications were qualified for the analysis.

Research results and discussion

1. Economic impact of the pandemic

In the agri-food system, the pandemic was symmetric with asynchronous timing. Symmetrical means affecting the demand and supply side simultaneously, but the severity felt by different groups of actors was not synchronised in time.

On the supply side, the effects of the pandemic could be seen throughout the food supply chain, consisting of processes such as production, packaging, distribution and storage (Chen et al., 2020). The situation in markets related to the food economy, i.e. the input market and the labour market, also changed.

The previous two crises (the global financial crisis in 2008, and the sanctions against Russia in 2014) gave rise to fears that international trade in agri-food commodities would fall and food prices would rise (Mizik, 2021). In the initial phase of the pandemic, the reduction in international trade, including trade in agri-food products (partly taking advantage of the pandemic situation to ensure increased sales of domestic production) and the emergence of significant demand pressures, led to insufficient food supplies in various parts of the world, translated into higher prices for certain products in some regions (meat, fruit and vegetables) (International Trade Center, 2020). However, after the initial shock period, the pandemic did not affect international trade flows in agri-food commodities (Beckman and Countryman, 2021; Kerr, 2021).

Given the initial period of the pandemic, it can be concluded that the main supply chains were not able to meet the basic needs of consumers. Panic buying and limited production by the food industry as well as problems in logistics operations led to shortages of many agri-food products (Barrett, 2020). Problems in accessing food items have particularly affected people such as those living in remote rural regions or elderly consumers and people with disabilities. New sales channels such as online sales and home delivery have not reduced food access problems for these groups, as they do not always have the opportunity to use these services (Lioutas and Charatsari, 2021).

However, studies show that in the agricultural sector the negative impact of the pandemic on production was smaller than in other sectors of the economy (Beckman and Countryman, 2021). It is worth noting that, in the longer term, the global average production of many agricultural commodities increased during the pandemic compared to the pre-pandemic year. Production increases were recorded in all commodities, except from cotton production. The reduction in cotton production was largely influenced by reductions in clothing purchases due to the periodic closure of shopping malls and also due to the shift to working from home (Beckman and Countryman, 2021). The smaller impact of the pandemic on the decline in agricultural output may be because agriculture produces goods that are essential to life - if an individual loses income,

they will still need to buy food, while they can cut spending on non-essential goods. Additionally, agricultural production is often planned well in advance, with farmers making planting decisions several months in advance.

During the pandemic, the discussion about the crucial role migrant workers play in current agri-food systems was revived. These workers represent one of the more vulnerable groups to infectious diseases, and their access to health services remains limited (Liem et al., 2020). The production of staple crops is highly mechanised in developed countries, so the border closure did not have a large impact on production levels, but more labour-intensive crops (fruits and vegetables), which require a lot of human labour, are more vulnerable to the effects of COVID-19 (Laborde et al., 2020). The impact of the pandemic is, therefore, felt most on farms that depend on seasonal sales, rely on migrant labour, (in particular fruit and vegetable production and horticulture) and on farms that derive their income from the sale of goods and services outside the home. In several European countries, the situation is complicated by the high proportion of seasonal and migrant farmworkers who are undeclared and work in the informal and grey economy (Erizanu, 2020).

Changes on the demand side appear to be much more likely to be felt across the economy and may have long-term impacts on the agricultural sector. During the pandemic, the way food is bought and consumed changed (Giudice et al., 2020). The first phase of the COVID-19 pandemic, despite food industry assurances of food availability, was characterised by panic buying by consumers who engaged in hoarding behaviour in anticipation of movement restrictions and fear of disruption to food distribution systems (Hobbs, 2020). As a result of the crisis, there was an increased tendency to provide preservable products (pasta, rice, canned fish, canned tomatoes, etc.) to build up household stocks, and a reduction in demand for perishable products (Richards and Rickard, 2020). This has meant great difficulty in meeting the high demand for some staple foods, while other products have experienced significant declines in both sales and prices. The closure of restaurants, hotels, caterers and bars has further reduced sales and price of these products (World Bank Group, 2020). Such a situation implies high income insecurity for farmers. At the same time, the reduction in consumer purchasing power is expected to reduce farmers' income in the long term. Such a situation may reduce, mainly by small-scale producers, expenditure on plant protection and animal health, which threatens the quality and quantity of production (Lioutas and Charatsari, 2021).

The closure of restaurants and hotels is one sector of the food economy that has had a significant impact on the decline in GDP from agriculture, especially in countries where a significant proportion of food expenditure is spent on eating out. In the US in 2019, out-of-home dining expenditure accounted for 52% of total food expenditure (USDA ERS - Food Price Outlook). Spending on eating out dropped significantly during the pandemic, which had a major impact on the economy. On the one hand, this sector reports demand basic agricultural products, on the other hand, it is a place of employment. Although spending on out-of-home consumption in the US accounts for more than half of food spending, the higher margins in the FAFH sector than in grocery shops mean that this sector accounts for about 1/3 of the food supply (Lusk et al., 2020). It can therefore be surmised that the impact of this sector on GDP was less due to reduced demand for agricultural products and much more related to lost labour income and restaurant receipts (Beckman and Countryman, 2021).

2. Social impact of the pandemic

The social impact of a pandemic covers many aspects, including psychological, health, sociological, etc. dimensions. This article focuses on the social impacts of pandemics that relate to agriculture and the food economy.

The social impact of pandemics may be a reduction in the employment of low-skilled people in agriculture. Interest in smart agricultural technologies has increased during the COVID-19 pandemic. Such technologies have the potential to replace agricultural workers for whom livelihood options outside agriculture are limited (Lioutas and Charatsari, 2020). From this point of view, smart technologies may generate more social problems than they potentially solve (Rose et al., 2021).

One of the most severe effects of the COVID-19 pandemic is the threat to food security. Foreign trade restrictions and loss of income due to business constraints have caused food security problems in many developing countries. The fear that food markets would be affected by logistical constraints and labour shortages put pressure on prices. UNCTAD (United Nations Conference on Trade and Development, (UNCTAD, 2020) reported that low-income nations utilized 37% of their export income for importing food products. This rate is 5 times greater than the corresponding value in developed countries. This is why external shocks affect developing countries more. Many exporters of cereal products have reduced exports to ensure an adequate supply of cereals to their countries. This could lead to a global food crisis, primarily affecting countries that rely on food imports (World Food Programme, 2020). However, food security threats affect not only developing countries but most countries in the world (Dudek and Spiewak, 2022). The sharp decline in low-wage employment in decommissioned service sectors has meant that in the US, food insecurity, broadly defined as "without access to enough food for an active, healthy life" will affect 54 million Americans, a 46% increase from 2018 (Gundersen et al., 2020). The closure of production in various areas of the economy resulted in the loss of jobs for a large segment of the population. As a consequence, the number of people who lost liquidity also grew, pushing them to the brink of poverty and jeopardising their chances of meeting even the basic needs for proper nutrition during the pandemic. This situation also resulted in a change in the structure of demand on food markets (change in the population's diet) in favour of relatively more easily available products with a longer shelf life (easier to store and transport), such as highly processed food and cereal products, combined with lower demand for meat (Schmidhuber, 2020). Access to food has also deteriorated, due to restrictions on movement, which can lead to a serious reduction in food security for certain groups in society, i.e. the elderly, the less well-off, those living in smaller, poorly equipped and more isolated localities.

Consumer behaviour changed during the pandemic. The changes were due to the pandemic itself, as well as to government restrictions. The changes primarily involved increased online shopping (Jílková and Kralová, 2021). This resulted in the emergence of new online shops, but also a growing group of food producers offering AND selling their products online (Dudek and Spiewak, 2022). The number of people shopping in local shops increased, as authorities recommended a minimum number of visits to retail outlets (especially over long distances) (Mehta et al., 2020). Large food shops were considered too crowded and less safe than small shops. In addition, increasingly restrictive travel restrictions encouraged spending in local shops (Fanelli, 2021). In many countries, interest in local food during lockdowns also increased. At the same time, however, limited sales growth could be observed in local markets, many of which were closed due to a lack of permanent structures.

The social impacts of the pandemic also include an increase in 'responsible' consumption, thus reducing food waste (Fanelli, 2021). Thinking about food waste is an important aspect of food consumption, especially under conditions of the limited capacity of agricultural ecosystems, as well as growth of the Earth's population and high utilisation of food production resources (Parlinska et al., 2020).

The COVID-19 pandemic has significantly increased the social exclusion of vulnerable groups in society. One such group is the elderly, who are essentially deprived of personal contact with other members of society. Older adults are at high risk of COVID-19 and often experience severe disease. As a result, they

have had to restrict movement. These behavioural changes are likely to affect the social ties and quality of life of older adults (Seifert et al., 2021). As population ageing affects many developed countries (United Nations, 2020), and additionally in these countries rural populations are older than in urban areas (Davis et al., 2012), the phenomenon of social exclusion is likely to affect a significant proportion of the population, especially in rural areas.

In addition to social ties, the pandemic has further deepened the digital exclusion of various groups of people. One such group is the elderly. They are more often than younger people unable to take advantage of the opportunities offered by modern information and communication technologies (ICT), such as smartphones, tablets and high-speed internet services. Analyses predict an increase in the importance of internet sales and an increase in the use of digitalisation tools, both in households and in businesses and administrations (Zeverte-Rivza et al., 2021), which will further increase the digital diversity of society. There is also a growing digital divide between urban and rural areas (Philip and Williams, 2019). Weak rural telecommunications infrastructure hinders rural development, increases regional growth gaps and ultimately affects the competitiveness of national economies (Salemink et al., 2017). Despite broadband access, many rural communities may not be able to fully exploit the potential of this technology and remain at a disadvantage compared to cities (Philip and Williams, 2019). This is often due to a lack of desire to use the internet, the limited financial capacity to purchase internet access or an ICT device, and a lack of ICT literacy even if they have access (Townsend et al., 2017).

Conclusions

- 1) This paper aimed to examine the consequences of the global COVID-19 pandemic on agriculture, agri-food system and rural areas in developed countries as identified in the literature. The analysis showed that every link in the food supply chain was affected by the pandemic but the extent of the impacts varied.
- 2) The volume of agricultural production appears resilient to the impact of the pandemic. World production of most commodities increased during the pandemic compared to the year before. Only cotton production decreased. It should be emphasised, however, that the situation in individual regions of the world, or individual countries, varies. At the same time, changes in the labour market caused by the restriction of movement may influence production in the following years, especially of those commodities, the harvest of which is not mechanised. In addition, changes in agricultural commodities and certain food processing sectors may affect agricultural markets over the next few years, given the lags in production cycles attributable to agriculture.
- 3) The pandemic has significantly reduced the food security of developing countries, but this effect has also affected a large part of the population in developed countries. Deterioration in household incomes may have reduced food availability. Lack of access to food affected particularly the elderly, the disabled and poorer households. Therefore, it seems justified to focus aid activities on households whose food security is the most threatened.
- 4) Household consumption behaviour changed during the pandemic. E-commerce became more important. Reduced ability to eat out has had a very large impact on GDP, especially in countries where out-of-pocket expenses account for a large share of food expenditures.
- 5) The pandemic has significantly increased the income insecurity of farms, especially those that are seasonal sellers, rely on migrant labour, and derive their income from the sale of goods and services away from home. This can have long-term effects on agriculture and the food economy. In the current situation, however, analysing the longer-term impacts of COVID-19 may be difficult due to the

increasing difficulty in disentangling the effects of the pandemic from other shocks that have occurred or may yet occur.

6) The greatest negative effects of the pandemic seem to be related to the uncertainty of farmers' income. A system of economic support and subsidies in the face of economic losses should therefore be developed. In addition, it is important to work on the development of local supply chains and make it easier for farmers to develop alternative sales methods. It is also related to actions aimed at reducing digital exclusion, as well as building strong developed communities in rural areas, which can increase the resilience of agricultural systems to various negative events.

7) Among the social aspects, the greatest consequences concerned people excluded from society for various reasons. Societal cohesion should therefore be one of the top priorities in efforts to mitigate the effects of a pandemic.

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